IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

G.O., No. 957 I., 7th September 1906.
58

Extension of the gathering ground of the Periyar Reservoir.

Stating that the investigation of the engineering features of the proposal for the — should not be delayed until the Survey department have completed the survey of the basins of the Periyár and Pambiar rivers, and requesting the Surveyor-General to arrange for the survey of the tract under reference.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Letter No. 958 I., 7th September 1906.

Extension of the gathering ground of the Periyar Reservoir.

REQUESTING the Surveyor-General to arrange for the survey of that part of the catchment area of the Periyár and Pambiar rivers lying south of 9° 32′ and east of 76° 10′.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., No. 957 I., 7th September 1906.

Extension of the gathering ground of the Periyar Reservoir.

Stating that the investigation of the engineering features of the proposal for the —should not be delayed until the Survey department have completed the survey of the basins of the Periyár and Pambiar rivers, and requesting the Surveyor-General to arrange for the survey of the tract under reference.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

I

G.O., No. 702 I., dated 27th June 1906.

ABSTRACT.—Letter from the Government of India forwarding copy of Note by the Inspector-General of Irrigation on the extension of irrigation on the Periyár canal system communicated to the Superintending Engineer, VI Circle, with the remark that the investigations recommended by the former officer and the construction of a regulator for the Periyár right bank escape be proceeded with and a letter intimating the action proposed to be taken by this Government ordered to be forwarded to the Government of India.

II

Letter—from S. B. MURRAY, Esq., Superintending Engineer, VI Circle.
To—the Chief Engineer for Irrigation.
Dated—Trichinopoly, the 3rd August 1906.
No.—454-C.E.

With reference to G.O., No. 702 I., dated 27th June 1906, I have the honour to inform you that no really useful investigation with a view to increasing the catchment area of the Periyár river can be undertaken until the catchment area of the Periyár river, and the country lying to the south and west of it has been regularly surveyed. It is not a question of "completing" any investigation. The whole thing will have to be started afresh, as none of the 1903 work has been put on paper.

The Inspector-General of Irrigation makes a point of ascertaining what extent of additional catchment area can be made use of, and this cannot be known unless the whole country has been completely mapped. I do not know what extent of country above the Periyár lake remains unsurveyed as there are no maps in this office to refer to, but assuming it to be 200 square miles, it is understood that a party of the Government of India Survey would be able to manage this in a few months. I believe the Government of India have a party working in this Presidency at the present time, and I would suggest that the first thing to be done is to ask India to transfer this party to the Periyár to complete the survey there.

2. I am now scrutinising an estimate for lowering the watershed cutting between the Periyár lake and the tunnel, and also for straightening the tunnel. By the time this work has been done, the new maps should be ready and the country can then be methodically attacked with a view to seeing how best the supply to the Periyár lake can be increased. Any investigation now would be merely groping in the dark, and although it would probably result in proof that water from some other catchment area *could* be diverted into the Periyár, the amount of water, and from how large a catchment area, would not be known.

Order—No. 957 I., dated 7th September 1906.

Government are of opinion that the investigation of the engineering features of the proposal for extension of the gathering ground of the Periyár reservoir should not be delayed until the Survey department have completed the survey of the basins of the Periyár and Pambiar rivers.

2. The Surveyor-General of India will be requested to arrange for the survey of the tract under reference.

3. The following letter will be sent.

[Here enter No. 958 I., dated 7th September 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, VI Circle.
,, Examiner, Public Works Accounts.
,, Revenue department.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

Letter No. 958 I., 7th September 1906.

Extension of the gathering ground of the Periyar Reservoir.

Requesting the Surveyor-General to arrange for the survey of that part of the catchment area of the Periyár and Pambiar rivers lying south of 9° 32′ and east of 76° 10′.

No. 958 I., 7th September 1906.

PUBLIC WORKS DEPARTMENT.

Irrigation.

From

C. A. SMITH, Esq.,

Acting Joint Secretary to the Government of Madras,

Public Works Department, Irrigation Branch,

To

The SURVEYOR-GENERAL OF INDIA,

Dated Ootacamund, the 7th September 1906.

Sir,

I am directed to forward an extract from a Note by the Inspector-General of Irrigation recommending the investigation of a proposal for extending the catchment area or gathering ground of the reservoir on the Periyár river in Travancore.

2. I am to point out that nearly the whole of the present catchment area is unsurveyed and that its extent is not even approximately known. In years of light rainfall the run-off is insufficient to fill the reservoir and it is therefore proposed to dam up another river called the Pambiar or Paradise and to divert part or all of its waters into the Periyár lake.

3. In order that it may be ascertained whether this proposal, if found practicable, will be worth executing, it is necessary to know what quantity of water will be probably available in years of poor rainfall and the most certain means of estimating this quantity is considered to be the ascertainment and comparison of the catchment areas of the Periyár and Pambiar rivers. I am accordingly directed to request you to be good enough to arrange for the survey of that part of the catchment area of the two rivers lying south of 9° 32′ and east of 76° 10′.

4. The country is difficult and from the commencement of the hot weather until the rains break, very feverish; all that is required for the purposes of this Government is a fairly accurate demarcation of the watershed of the rivers within the limits stated above. It is unnecessary to fill in details of the area demarcated except to show what is open country and what is forest.

It is desirable that if practicable the survey should be undertaken during the next six months.

5. The tract in question lies within the boundaries of the State of Travancore and the Darbar which gave permission in 1902 for the requisite investigation to be made has been asked to renew its permission.

I have the honour to be,

Sir,

Your most obedient servant,

C. A. SMITH,

Ag. Joint Secretary to Government,

Irrigation Branch.

[Annexure.

ANNEXURE TO LETTER No. 958 I., DATED 7TH SEPTEMBER 1906.

Note on extension of irrigation on the Periyár Canal System by Mr. J. Benton, C.I.E., Inspector-General of Irrigation, dated 26*th March* 1906.

Gross commanded area.—This is 768,000 acres as shown in the Triennial Revenue report, paragraph 2, page 55.

2. *Commanded culturable area.*—The annexed statement A shows in full detail particulars of the commanded culturable area which is 121,308 acres.

3. *Forecast and realization.*—The following statement shows these for areas irrigated and for net revenues :—

Year from completion in 1895.	Irrigated area.		Net revenue.		Percentage of net revenue on capital cost.
	Forecast.	Actuals.	Forecast.	Actuals.	
	ACS.	ACS.	RS.	RS.	
1896–1897	19,262	67,051	10,681	66,215	0·80
1897–1898	38,503	94,615	62,136	1,22,013	1·42
1898–1899	57,744	109,025	1,13,591	1,43,730	1·65
1899–1900	76,985	129,232	1,65,046	2,16,933	2·47
1900–1901	96,246	142,869	2,16,501	3,02,738	3·43
1901–1902	115,467	153,862	2,84,956	3,42,312	3·84
1902–1903	134,708	154,068	3,53,411	3,27,587	3·64
1903–1904	153,949	152,614	4,21,866	3,54,941	3·86
1904–1905	173,190	156,634	4,90,321	3,80,565	4·08
1905–1906	192,431	..	5,58,776	..	..

4. *Course of procedure.*—The foregoing particulars show as follows :—

(i) That irrigation operations are being carried on in 121,308 acres out of a gross commanded area of 768,000 so that a large extension of the former is possible if the water-supply is available ; moreover, it is very desirable to distribute the benefits of irrigation more widely.

(ii) That the irrigated areas show little increase in recent years, while they offer little promise under present conditions, of attaining the ultimate forecast of 192,431 acres.

(iii) That the actual irrigated areas and revenues are much lower than the forecast figures ; the falling off is found to be chiefly in first crop.

(iv) That double cropping is already carried on to a very undesirable extent, the area actually cultivated being only about 109,000 acres, while the irrigation in this area in the two crops attained 156,634 acres in 1904–1905. To attain the forecast area of 192,431 acres would require 77 per cent. of double cropping.

(v) Exhaustion of the soil is a fairly certain result of continuing present procedure. The Periyár water is not silt laden.

5. *Reservoir.*—The Chief Engineer in his note dated 28th October 1905 annexed to Secretary's letter No. 1021 I, of the same date, shows that there has averagely been 10,000 millions cubic feet of water passed into the escape, being in excess of what the reservoir will safely contain. To make the reservoir contain an extra supply the only work to be considered is the dam ; this can be strengthened and raised almost to any desired extent by a system of extended buttresses on the down stream side with horizontal arches supporting the existing dam and abutting against the long pier buttresses just mentioned.

6. *Lowering outlet.*—Mr. H. T. Keeling, Executive Engineer, has suggested the advisability of lowering the 2,600 feet approach channel to the tunnel to about R L. 100 or 101 and that this level be carried through to the 5 or 6 feet fall at the head of the tunnel beyond the gate chamber—the two semi-circular tunnels beyond the sluice gate being closed. This work would, according to Mr. Keeling, cost Rs. 60,000

to Rs. 70,000. The advantages of carrying this out would be to admit of the reservoir idle water being drawn off to a lower level by about 9 feet than is now possible, while the discharging capacity of the tunnel would also be increased. These are great advantages worth much more than the sums mentioned. I advise that the execution of this work may be dealt with along with others which I will detail below.

7. *Tunnel.*—The amount of water which the tunnel can pass is at present limited to 1,350 cusecs; it would however be a much simpler matter to lower the floor 2·5 to 3·0 feet than it was to drive the existing tunnel; the opening is now 12 feet wide and 8 feet high so that the capacity could be increased from 30 to 40 per cent. by lowering the floor by 2·5 and 3·0 feet, respectively.

8. *Possible extensions.*—There are additional areas which can be irrigated at the tail ends of most of the distributaries, and by extending the main canal itself. The gross commanded area is 768,000 acres as compared with 121,308 acres in which operations are now carried on.

9. *Unusually unfavourable years.*—The year ending 30th April 1905 was one of these, and the reservoir did not fill up to its recognised full supply level by 3·5 feet. The remedy for this may or may not be too costly, but it consists in increasing the catchment area, by diverting the upper portions of adjacent hill torrents into the Periyár basin by having recourse to dams, cuttings, tunnels and embankments; with dams and tunnels many obstacles can be overcome. It is believed that the Paradise river can be partly diverted and some diversions may be possible in the opposite direction.

10. *Storage site almost unique.*—Good storage sites are very difficult to procure and it is advisable to turn that at Periyár to the very best account. If the catchment area can be considerably increased, the extra works will most probably prove very remunerative.

11. *Investigations recommended.*—I would recommend that investigations may be made to ascertain the following:—

(i) What extension of the catchment area is feasible, the probable run-off,—and the cost approximately?

(ii) What amount of raising would be required for the dam to admit of the reservoir safely containing the additional supply likely to be procurable from the extended catchment area, and what the approximate cost would be?

(iii) What enlargement of the tunnel would be required and what the cost is roughly estimated to be?

(iv) What enlargement of the culturable commanded area is feasible,—what additional supply could be utilized, and what is proposed for using that which is available?

* * * * *

J. BENTON,
Inspector-General of Irrigation.

PUBLIC WORKS DEPARTMENT
(IRRIGATION BRANCH).

NOTES CONNECTED WITH G.O., Nos. 957, 958 I, DATED 7TH SEPTEMBER 1906.

[SUBJECT.—*Investigation for increasing the catchment area of the Periyár river.*]

From the Superintending Engineer, VI Circle, No. 454-C.E., dated 3rd August 1906.

To Under Secretary—

Submitted for orders.

M.S.V.
6-8-06.

To Joint Secretary—

The Surveyor-General may be addressed with reference to the survey of the catchment areas of the Periyár and Pambiar and the Superintending Engineer informed that our investigations may proceed.

T. W. S. SMYTH.
6-8-06.

Yes. I do not agree with the Superintending Engineer that our investigation should be deferred on this account as I should like them to be pushed through this year as already arranged for. Superintending Engineer should be informed accordingly.

C. A. SMITH.
6-8-06.

To Joint Secretary—

Draft order and letter to the Surveyor-General are put up. They should be accepted by Revenue department.

T.W.S.S.
7-8-06.

To His Excellency the Governor for approval. It may be desirable not to issue this order until the reply is received from Travancore to the request for permission to continue the investigation.

C.A.S.
7-8-06.

To Revenue un-officially for acceptance of the draft order before submission to His Excellency the Governor.

C.A.S.
7-8-06.

REVENUE DEPARTMENT.

To Secretary—

Revenue may accept the draft. The only Survey of India party now working in Madras is Party No. 19, which is doing forest surveys in Gódávari, Canara, etc. Its programme for 1906-1907 is more or less uncertain (*vide* page 2 of file in G.O., No. 24, Mis., dated 5th January 1906). If the Surveyor-General is able to send a detachment to do the work at Periyár, Revenue need not object to the consequent delay in the forest survey proper.

F. B. EVANS.
9-8-06.

No objection in Revenue to the draft order.

A. G. CARDEW.
10-8-06.

To the Public Works Department (Irrigation Branch).

PUBLIC WORKS DEPARTMENT
(IRRIGATION BRANCH).

To Under Secretary—

The draft order may, it is submitted, be now circulated to His Excellency the Governor.

A.R.
11-8-06.
G.V.
11-8-06.

T.W.S.S.
11-8-06.

To His Excellency the Governor—

C.A.S.
11-8-06.
A. L[AWLEY].
16-8-06.

Order not to issue until reply has been received from Travancore.

T.W.S.S.
16-8-06.

Will the Political department kindly state if the permission of the Travancore Darbar has been received for the investigation proposed to be carried on in their territory in connection with the diversion of the Paradise river into the Periyár.

A.R.
27-8-06.

T.W.S.S.
27-8-06.

To the Political Department u.o.

POLITICAL DEPARTMENT.

Submitted that Public Works Department (Irrigation) may be informed that no reply has yet been received from the Resident in Travancore and Cochin. A draft reminder to the Resident is submitted separately.

A.L.P.
27-8-06.
J. A. DE R.
27-8-06.

A.G.
28-8-06.

To the Public Works Department (Irrigation Branch).

PUBLIC WORKS DEPARTMENT
(IRRIGATION BRANCH).

To Under Secretary—

The Travancore darbar having given permission for the prosecution of surveys in their territory in connection with the extension of irrigation under the Periyár (*vide* letter No. 476, dated 31st ultimo, from the Resident in Travancore and Cochin), submitted that the draft order and the letter to the Surveyor-General may now issue.

A.R.
5-9-06.
G.V.
5-9-06.

Issue.

T.W.S.S.
5-9-06.
C.A.S.
5-9-06.

[*G.O., Nos.* 957, 958 *I., dated* 7*th September* 1906.]

1,000—22-8-06.

CURRENT FILE.

Stock Form No. 141
1?,000-29-6-05.

PUBLIC WORKS DEPARTMENT.

CURRENT No. 4257

Received 6. 8. 1906.

Registered 8/8 1906.

ENCLOSURES. { Plans No. / Others No.

Total

SPARE COPIES.

Passed on by Registering Clerk ...
" " U. R. Clerk ...
" " Referencer ...
" " Record Superintendent.
" " Drafting Officer ...

Subject.

Investigation for increasing the catchment area of the Periyar river — Reporting that no — can be undertaken until a regular survey has been made of the adjoining country & suggesting the employment of India Survey ~~for~~ work there —

No. 454 CE

Station, Trichinopoly. *Dated the* 3rd August ~~July~~ 1906.

From (Name) S. B. MURRAY Esquire.,

(Designation) Superintending Engineer, VI Circle.

To The Chief Engineer for Irrigation, ~~The Secretary~~ *to the Government of Madras,*

Public Works Department.

Sir,

Flag X

With reference to G.O.No.702-I, dated 27th June 06, I have the honour to inform you that no really useful - investigation with a view to increasing the catchment - area of the Periyar river can be undertaken until the - catchment area of the Periyar river, and the country lying to the south and west of it has been regularly surveyed. It is not a question of "completing" any investigation. The whole thing will have to be started --- afresh, as none of the 1903 work has been put on paper.

The Inspector-General of Irrigation makes a point of ascertaining what extent of additional catchment area

3P

can be made use of, and this cannot be known unless the whole country has been completely mapped. I do not know what extent of country above the Periyar Lake remains unsurveyed as there are no maps in this office to refer to, but assuming it to be 200 Sq.miles it is understood that a party of the Government of India Survey would be able to manage this in a few months. I believe the Government of India have a Party working in this Presidency at the present time, and I would suggest that the first thing to be done is to ask India to transfer this Party to the Periyar to complete the survey there.

The party working in Godaveri Resurvey has finished its work and returned.

2. I am now scrutinising an estimate for lowering the watershed cutting between the Periyar Lake, and the tunnel, and also for straightening the tunnel. By the time this work has been done the new maps should be ready and the country can ~~be~~ then be methodically attacked with a view to seeing how best the supply to the Periyar Lake can be increased. Any investigation now would be merely groping in the dark, and although it would probably result in proof that water from some other catchment area could be diverted into the Periyar, the amount of water, and from how large a catchment area would not be known.

I have the honour to be

Sir,

Your most obedient servant,

[signature]

Superintending Engineer,

VI Circle.

P.V.
31.7.06

1,000—22-8-05.

NOTES.

[illegible] 957 [illegible]

7/9/06

P.W.D. Irrigation.

Investigation for increasing the catchment area of the Periyar river.

1P

From the Superintending Engineer, VI Circle, No. 454 C.E. d/ 3rd Aug. 1906

D.I.

Submitted for orders.

Enso 6806

I

The Surveyor-General may be addressed with reference to the survey of the catchment areas of the Periar & Pambiar & the S.E. informed that our investigations may proceed.

[illegible]

6/8/06

Yes. I do not agree with the S.E. that our investigations should be deferred on this account as I should like them to be pushed through this year as already arranged for. S.E. should be informed accd.

[illegible]

6/8

2

2P

I

Draft order & letter to the Surveyor-General are put up, they should be accepted by Rev Depdt

JWAS

7/8/06.

H.C
See if these are in order

To His Excellency the Govr for approval. It may be desirable not to issue this order until the reply is received from Travancore to the request for permission to continue the investigation.

[illegible]
7/8.

To Rev. U.O for acceptance of the Draft order before submission to H.E the Govr

[illegible]
7/8

R.D

Secy

Rev. may accept the draft
The only survey of India party now working in Madras is Party No. 19, which is doing forest surveys in Godavari, Canara etc. The

P. W. D. IRRIGATION.
320 D
Dated 8. 8. 6

REVENUE-C
1095

Recd
Depo } 8.8.06

REVENUE DEPARTMENT.

3P

programme for 1906-7 is more or less uncertain (vide p. 2 of file in fd. 24 d. 5.106) - If the Surveyor General is able to send a detachment to do the work at Periyar, Rev. need not object to the consequent delay in the forest survey proper -

Flag D.

[illegible]
9.5.06.

Rev wo No 1095 C/06-1
11 8 06

No objection in Rev: to the draft order.

[illegible] 10.8.06

PWD I u.o.

Final

P. W (Irrign) Dept

DI

The draft order may it is submitted be now circulated to H.E. the Governor

[illegible]
11/8/06
[illegible]
10.8.06

[illegible] 11/8/06

[illegible]
11/8/06

H. E. the Governor

[illegible]
16.8.06.

Order not to issue until reply has been received from Travancore.

(Ind) T.W.S.g.
16.8.06

4

7

P.W.D. Irrigation.

48

Will the Political department ~~please~~ Kindly state ~~state~~ if the permission of the Travancore Darbar has been received for the investigation proposed to be carried on in their territory in connection with the diversion of the Paradise river into the Periyar.

P. W. D. IRRIGATION.
U. O. No. 356 D
Dated 27. 8. 1906.

A
27/8/06

[signature]
27/8.

Pol. dept u.o

POLITICAL DEPARTMENT.

Submitted that P.W.D. (Irrigation) may be informed that no reply has yet been received from the Resident in T & C. A draft reminder to the Resident is submitted separately.

[initials] 27.8.06 [initials] 27.8.06 [initials] 28.8.6 P.W. Dno

Record

[initials]

D.I.

P.W.D. Irrigation.

D.I.

The Travancore darbar haing given permission

for

5P

for the prosecution of surveys in their territory in connection with the extension of irrigation -- under the Periyar, (vide letter No. 476 dated 31st ultimo from the Resident in Travancore and Cochin in the linked file), submitted that the draft order and the letter to the Surveyor-General may now issue

page 4 Cf. in linked file

5/9/06

Issue
[illegible]
5/9.

5/9/06

E. I. Form No. 1.

H.E.

Investigation for increasing the catchment area of the Periyar lake

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

again

READ the following

Flag X A G.O. No. 702 I dated 27th June 1906. 186

Quote with abstract

Read also the following:--

Print

Ltter from the Supg. Engineer, VI Circle, No. 454 C.E. d/ 3rd August 1906

Print Notes

ORDER. No 957 I dy 7th September 06

4 P

Government are of opinion that the investigation of the engineering -- features of the proposal for extension of the gathering ground of the Periyar reservoir should not be delayed until the Survey department have completed the survey of the ~~baisns~~ basins of the Periyar and Pambiar rivers.

2. The Surveyor-General of India will be requested to arrange for the survey of the tract under reference.

3. The following letter will be --- sent:--

18.8.06.

not to issue until reply has been recd from Travancore

~~Issue~~

16/8

DI

20

To the Chief Engr for Irrgn.

,, Supg. Engr. VI Circle.

,, Examiner, P.W. Accts.

,, Revenue department.

5 P

H.E. No. 958 I dated 7th September 19

Letter No 958 I dy 7 September 1906

To

The Surveyor-General of India.

Desp'd 14/9/06

Sir,

I am directed to forward an -- extract

Issue 5/9/06.

DI

6 P

pp 3-4 & G.O. no 702-23 / 2206-06 X

extract from a Note by the Inspector-General of Irrigation recommending the investigation of a proposal for extending the catchment area or gathering ground of the reservoir on the Periyar river in Travancore.

2. I am to point out that nearly the whole of the present catchment area is unsurveyed and that its extent is not even approximately known. In years of light rainfall the run-off is insufficient to fill the reservoir and it is therefore proposed to dam up another river called the Pambiar or Paradise and to divert part or all of its waters into the Periyar lake.

3. In order that it may be ascertained whether this proposal, if found practicable, will be worth executing, it is -- necessary to know what quantity of -- water will be probably available in years of poor rainfall and the most certain means of estimating this ---- quantity is considered to be the ascertainment and comparison of the catchment areas of the Periyar and Pambiar rivers. I am accordingly directed to request you to be good enough to arrange for the survey of that part of the catchment area of the two rivers lying south of 9° 32' and East of 76° 10'.

4. The country is difficult and from the commencement of the hot weather until the rains break, very feverish; all

All that is required for the purposes of this Government is a fairly accurate demarcation of the watershed of the rivers within the limits stated above. It is unnecessary to fill in details of the area ~~contained within~~ demarcated except to showing what is open country and what is forest.

It is desirable that if practicable the survey should be undertaken during the next six months

5. The tract in question lies within the boundaries of the State of Travancore and the Darbar which gave permission in 1902 for the requisite investigation to be ~~carried~~ made has been asked to renew its permission.

[signature] 7/8/06. [signature] 7/8/06

[initials]

<u>Documents accompanying</u>

Extract of paras 1 to 11 of the I.G.'s Note d" 26.3.06.

(Ordinary Press)

Despd 14/9/06

V

Letter—from Mr. L. M. JACOB, C.S.I., Secretary to the Government of India, Public Works Department (Civil Works—Irrigation).
To—the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch.
Dated—Simla, the 4th May 1906.
No.—575 I.

In continuation of this office letter No. 573 I., dated the 4th May 1906, I am directed to forward herewith copy of a note, dated the 26th March 1906, by the Inspector-General of Irrigation, on the extension of irrigation on the Periyár Canal system, and to request that, with the permission of His Excellency the Governor in Council, a preliminary report on the lines suggested therein may be furnished for the consideration of the Government of India.

Annexure to letter No. I

ENCLOSURES.

Note on extension of irrigation on the Periyár Canal System by Mr. J. Benton, C.I.E., Inspector-General of Irrigation, dated 26th March 1906.

Gross commanded area.—This is 768,000 acres as shown in the Triennial Revenue report, paragraph 2, page 55.

2. *Commanded culturable area.*—The annexed statement A shows in full detail particulars of the commanded culturable area which is 121,308 acres.

3. *Forecast and realization.*—The following statement shows these for areas irrigated and for net revenues :—

Year from completion in 1895.	Irrigated area.		Net revenue.		Percentage of net revenue on capital cost.
	Forecast.	Actuals.	Forecast.	Actuals.	
	ACRES.	ACRES.	RS.	RS.	
1896–1897	19,262	67,051	10,681	66,215	0·80
1897–1898	38,503	94,015	62,136	1,22,013	1·42
1898–1899	57,744	109,025	1,13,591	1,43,730	1·65
1899–1900	76,985	129,232	1,65,046	2,16,933	2·47
1900–1901	96,246	142,869	2,16,501	3,02,738	3·43
1901–1902	115,467	153,862	2,84,956	3,42,312	3·84
1902–1903	134,708	154,068	3,53,411	3,27,587	3·64
1903–1904	153,949	152,614	4,21,866	3,54,941	3·86
1904–1905	173,190	156,634	4,90,321	3,80,565	4·08
1905–1906	192,431	..	5,58,776	..	..

4. *Course of procedure.*—The foregoing particulars show as follows :—

(i) That irrigation operations are being carried on in 121,308 acres out of a gross commanded area of 768,000 so that a large extension of the former is possible if the water supply is available; moreover it is very desirable to distribute the benefits of irrigation more widely.

(ii) That the irrigated areas show little increase in recent years, while they offer little promise under present conditions, of attaining the ultimate forecast of 192,431 acres.

(iii) That the actual irrigated areas and revenues are much lower than the forecast figures; the falling off is found to be chiefly in first crop.

(iv) That double cropping is already carried on to a very undesirable extent, the area actually cultivated being only about 109,000 acres, while the irrigation in this area in the two crops attained 156,634 acres in 1904-1905. To attain the forecast area of 192,431 acres would require 77 per cent. of double cropping.

(v) Exhaustion of the soil is a fairly certain result of continuing present procedure. The Periyár water is not silt laden.

5. *Reservoir.*—The Chief Engineer in his note dated 28th October 1905 annexed to Secretary's letter No. 1021 I. of the same date, shows that there has averagely been 10,000 millions cubic feet of water passed into the escape, being in excess of what the reservoir will safely contain. To make the reservoir contain an extra supply the only work to be considered is the dam; this can be strengthened and raised almost to any desired extent by a system of extended buttresses on the down stream side with horizontal arches supporting the existing dam and abutting against the long pier buttresses just mentioned.

6. *Lowering outlet.*—Mr. H. T. Keeling, Executive Engineer, has suggested the advisability of lowering the 2,600 feet approach channel to the tunnel to about R.L. 100 or 101 and that this level be carried through to the 5 or 6 feet fall at the head of the tunnel beyond the gate chamber—the two semi-circular tunnels beyond the sluice gate being closed. This work would according to Mr. Keeling cost Rs. 60,000 to Rs. 70,000. The advantages of carrying this out would be to admit of the reservoir idle water being drawn off to a lower level by about 9 feet than is now possible while the discharging capacity of the tunnel would also be increased. These are great advantages worth much more than the sums mentioned. I advise that the execution of this work may be dealt with along with others which I will detail below.

7. *Tunnel.*—The amount of water which the tunnel can pass is at present limited to 1,350 cusecs; it would however be a much simpler matter to lower the floor 2·5 to 3·0 feet than it was to drive the existing tunnel; the opening is now 12 feet wide and 8 feet high so that the capacity could be increased from 30 to 40 per cent. by lowering the floor by 2·5 and 3·0 feet, respectively.

8. *Possible extensions.*—There are additional areas which can be irrigated at the tail ends of most of the distributaries, and by extending the main canal itself. The gross commanded area is 768,000 acres as compared with 121,308 acres in which operations are now carried on.

9. *Unusually unfavourable years.*—The year ending 30th April 1905 was one of these, and the reservoir did not fill up to its recognised full supply level by 3·5 feet. The remedy for this may or may not be too costly, but it consists in increasing the catchment area, by diverting the upper portions of adjacent hill torrents into the Periyár basin by having recourse to dams, cuttings, tunnels and embankments; with dams and tunnels many obstacles can be overcome. It is believed that the Paradise river can be partly diverted and some diversions may be possible in the opposite direction.

10. *Storage site almost unique.*—Good storage sites are very difficult to procure and it is advisable to turn that at Periyár to the very best account. If the catchment area can be considerably increased the extra works will most probably prove very remunerative.

11. *Investigations recommended.*—I would recommend that investigations may be made to ascertain the following:—

(i) What extension of the catchment area is feasible, the probable run-off,—and the cost approximately?

(ii) What amount of raising would be required for the dam to admit of the reservoir safely containing the additional supply likely to be procurable from the extended catchment area, and what the approximate cost would be?

(iii) What enlargement of the tunnel would be required and what the cost is roughly estimated to be?

(iv) What enlargement of the culturable commanded area is feasible,—what additional supply could be utilized, and what is proposed for using that which is available?

12. *Preliminary report.*—I would suggest that the Madras Government may be asked to carry out the above investigations as early as possible, submitting a preliminary report accompanied by the necessary survey, particulars of works proposed, and an approximate estimate of probable cost,—revenue and returns on the expenditure.

13. *Escape regulator with Stoney's gates.*—If it is possible to increase the catchment area materially the height of reservoir full supply level would be raised, and with it the level of the top of the regulating gates. I would therefore advise that the regulator may not be constructed until the investigations above suggested are made, and until the question of ultimate expansion is finally decided on.

The work on the escape now in hand, should, in my opinion, stop at lowering of the saddle, a work which is approaching completion and for this reason may therefore be completed. The risk of carrying on for another year with the escape as it now is should, in my opinion, be run, since the escape is more efficient now as far as discharging capacity is concerned than it has been in the past nine years. To build the regulator before we are certain of the level at which the gates should be would in all probability result in waste of a large sum of money in raising the regulator hereafter.

14. *Facilities for inspection of the Periyár works.*—The usual course followed by officers inspecting the Periyár is to rail to Ammayanáyakkanúr and to proceed thence 69 miles by bullock cart to Koravanuth at the foot of the hills and 7 miles from the reservoir. After a long jolting journey of 69 miles by bullock cart Inspecting officers would find an inspection house at Koravanuth most serviceable. Many planters also proceed over this route. The quarters at Koravanuth consist of an old tool shed close to a village; they are barely good enough to be a stable, and the first question which presents itself to the traveller is whether it is feasible to sleep and have meals outside the unclean pest-stricken hovel. I would suggest that measures should be taken for obtaining a proper rest-house at this site.

J. Benton,
Inspector-General of Irrigation.

copy sent to Press.

ned for signature.

atched in print.

Number of copies required. { Order complete. / Letter only. / Order complete with Letter.

gain G.O., No. , dated 190 .

nt No.

osures to C. No.

er of Government.

ter of Government.

atement with ditto.

pers not filed up, being meant for despatch in original.

N.B.—

A = Print in full.
B = Not to be printed.
P = Print abstract only.
Q = Print heading only.